CALIFORNIA DIVISION OF MINES AND GEOLOGY

Fault Evaluation Report FER-48

November 28, 1977

1. Name of fault: Simi fault
2. Location of fault: Camarillo, Newbury Park, Moorpark, Simi, and Santa Susana 7.5 minute quadrangles, Ventura County (see figure 1).
3. Reason for evaluation: Part of a 10-year program.
4. List of references:

a) Dibblee, T.W., Jr., 1952, Unpublished geologic map of the Piru 15 minute quadrangle, scale 1:62,500.

b) Dibblee, T.W., Jr., 1958, Unpublished geologic map of the Santa Susana 15-minute quadrangle, scale 1:62,500.

c) Envicom Corporation, 1976, Geological and environmental studies for EDA Technical Assistance Grant no. 07-6-01529: Unpublished report prepared for the City of Simi Valley, p. 1-15, 58-62.

d) Geotechnical Consultants, Inc., 1968, Report for job no. V7072A (Las Llagas Dam Site): Unpublished consulting report completed for the Ventura County Flood Control District, on file with the City of Simi Valley.

e) Hetherington, G.E., 1957, Geology of the south Tapo Canyon area, Santa Susana quadrangle, Ventura County, California: Unpublished M.A. thesis, University of California, Los Angeles, map scale 1:12,000.

f) Jennings, C.W., 1975, Fault Map of California with locations of volcanoes, their springs and thermal wells: California Division of Mines and Geology, California Geologic Data Map Series, Map no. 1, scale 1:750,000.

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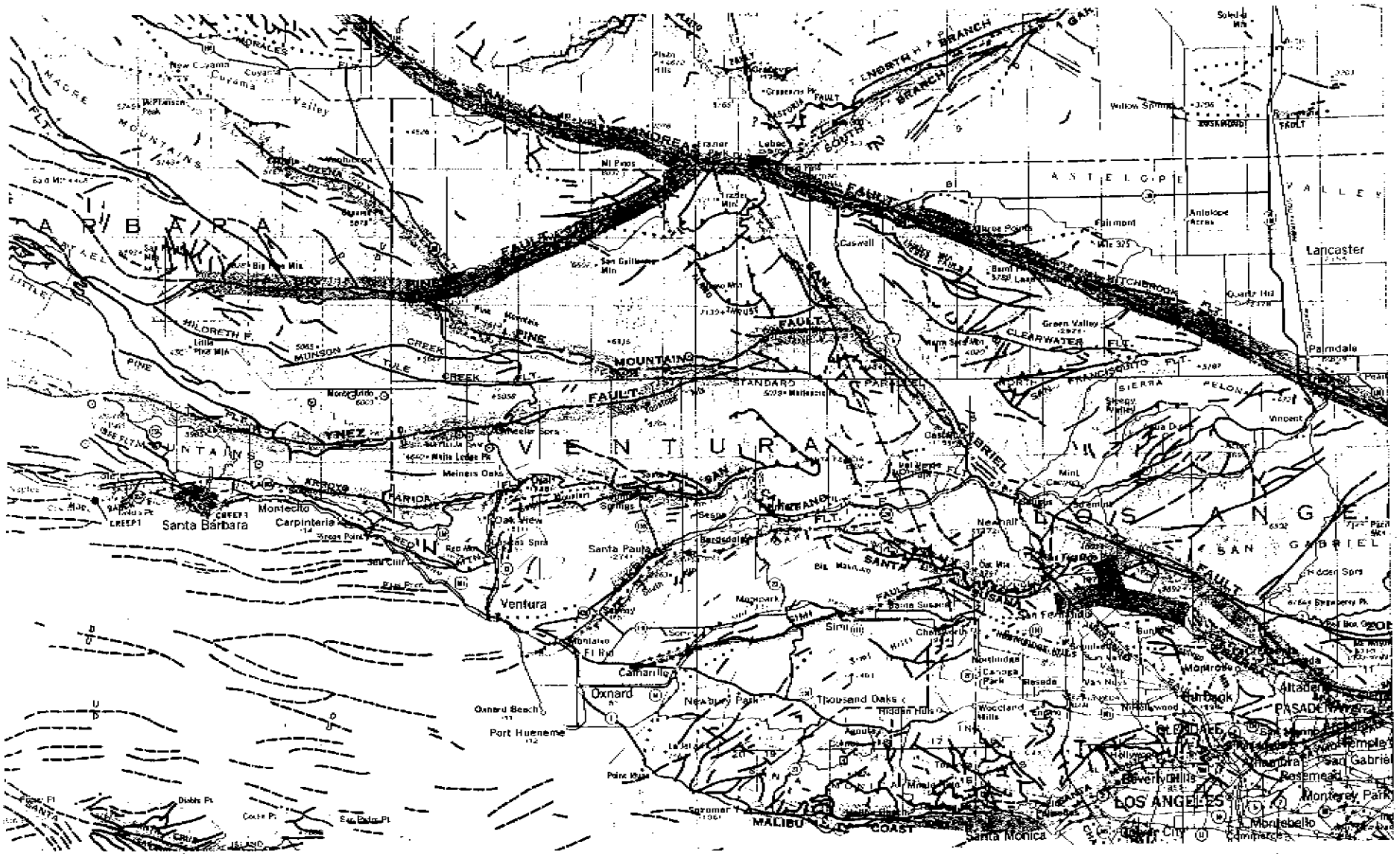
FIGURE 1. GENERAL LOCATION OF THE SIMI FAULT (JENNINGS, 1975; scale 1:750,000)



g) Martin, D.R., 1958, Geology of the western part of the Santa Susana Mountains, Ventura County, California: Unpublished M.A. thesis, University of California, Los Angeles, 75 p., map scales. 1:12,000 and 1:24,000.

h) Mukae,M.M., and Turner, J.M., 1975, Ventura County water resources management study, geologic formations, structures and history in the Santa Clara-Calleguas area in Compilation of technical information records for the Ventura County cooperative investigation: California Department of Water Resources, v. 1, p. 1-28, 2 plates.

i) Pasta, Dave, 1958, Geology of the Las Posas-Camarillo Hills area, Ventura County, California: Unpublished M.A. thesis, University of California, Los Angeles, 59 p., map scale 1:24,000.

NOTE: Map missing from CDMG copy.

j) Turner, J.M., and Mukae, M.M., 1975, Ventura County water resources study, effective base of freshwater reservoir in the Oxnard-Calleguas area in Compilation of technical information records for the Ventura County cooperative investigation: California Department of Water Resources, v. 1, p. 1-15, 1 plate.

k) Weber, F.H., Jr., Cleveland, G.B. Kahle, J.E., Kiessling, E.F., Miller, R.V., Mills, M.F., Morton, D.M., and Cilweck, B.A., 1973, Geology and Mineral resources study of southern Ventura County, California: California Division of Mines and Geology, Preliminary Report 14, 102 p. 5 pl., 9 figures, map scale 1:48,000.

l) Weber, F.H., Jr., Kiessling, E.W., Sprotte, E.C., Johnson, J.A., Sherburne, R.W., and Cleveland, G.B., 1975, Seismic hazards study of Ventura County, California: California Division of Mines and Geology, Open File Report 76-5LA, 396 p., 9 pl., map scale 1:48,000.

m) Ziony, J.I., Wentworth, C.M., Buchanan-Banks, J.M., and Wagner, H.C., 1974, Preliminary map showing recency of faulting in coastal southern California: U.S. Geological Survey, Miscellaneous Field Studies Map MF-585, 15 p., map scale 1:250,000, 3 plates.

5. Summary of available data:

The Simi fault is apparently a north-dipping reverse fault (Pasta, 1958, p. 43; Wentworth, et al., 1969, p. 14; Mukae and Turner, 1975, p. 18). Pasta (1958, p. 43) calculated from well data that the fault dip increases from 65° N in the eastern part, to 85°N near the western end of the Las Posas Hills. Weber, et al. (1975, p. 175) felt that the configuration of the surface trace of the Simi fault indicates that the dip of the fault is 45° or less. Pasta (p. 43) noted that numerous branch and splinter faults exist and that the apparent vertical separation is about 2500 feet within the Sespe Formation (Oligocene), but only about 200 feet within the Topanga Formation (Miocene). Pasta also notes (p. 43) the existence of weathered scarps (he implied that these are fault scarps) along the southern flank of the Las Posas Hills. Martin (1958), citing Pasta, depicts the Simi fault as buried under Quaternary terrace deposits.

Weber, et al. (1975, p. 190, photo 25 -- included here as figure 2) noted lineaments and "vague subsurface evidence" along the Simi fault trend. However, they concluded that the evidence for recent activity

FIGURE 2. From Weber, et al. (1975)

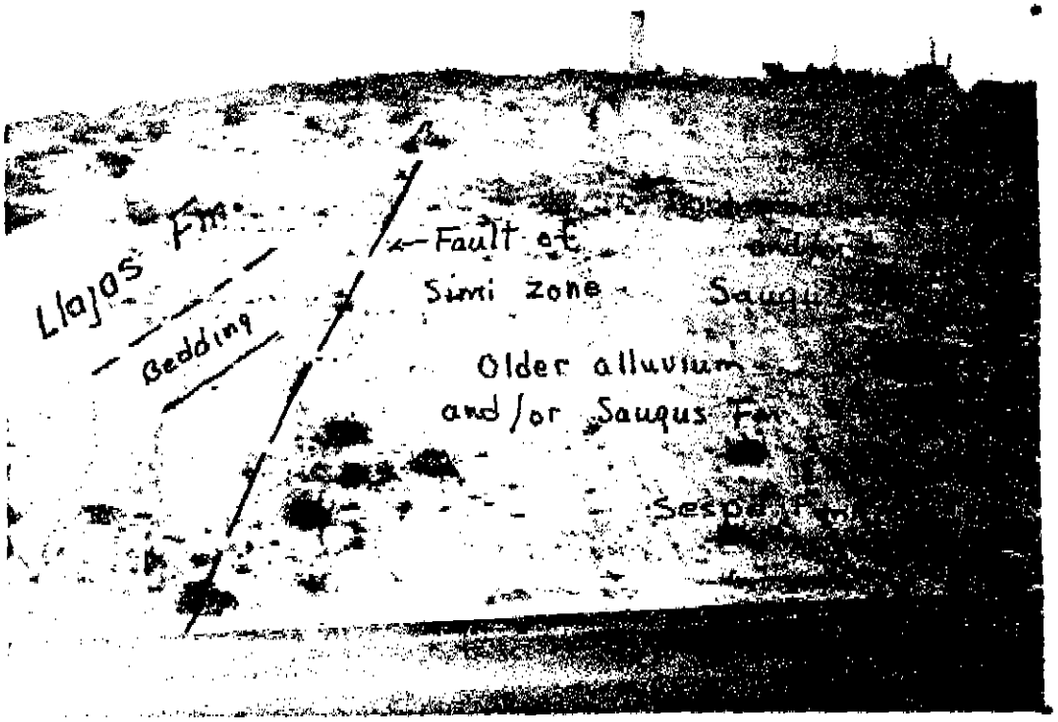


Photo 25. View east shows a fault of the Simi zone exposed in a roadcut along Tapo Canyon Road at the north edge of Simi Valley. Fault exposed dips about 70° north, and has displaced fine sandstone and siltstone of Eocene Llajas Formation to north (or left) up with regard to uppermost Saugus Formation or older alluvium of middle to upper Quaternary to south (or right). Simi fault zone along north edge of Simi Valley appears to have been active relatively recently, although this recency of activity may lessen toward the northeastern edge of the Valley. Cut is about 20 feet high.

was inconclusive. The basic question raised by Weber, et al. was whether the deposits cut by the fault are terrace deposits or Saugus Formation (Plio-Pleistocene). Turner and Mukae (1975, p. 8) note an apparent displacement of 200 feet, north side up, of groundwater bearing sediments along the Simi fault. Again, both Saugus and terrace deposits (or older alluvium) are groundwater bearing sediments.

Ziony, et al. (1974) show the Simi fault as late Quaternary in age, based on the apparent displacement of a late Pleistocene unit and some topographic expression of probable late Quaternary age.

Envicom (1976) conducted an investigation of the Simi fault for the City of Simi Valley. M.W. Kuhn, Environmental Planner for the City, stated that Envicom was denied access to the site on which they felt the most definitive information could be obtained. Thus, the sites trenched were their second and third choices. The easternmost trench site, at the western end of the Simi Valley, supposedly crosses a trace depicted by Weber, et al. (1975) as cutting Quaternary valley fill. The trench was located within a few hundred feet of some ponds, which some geologists felt were sag ponds (Envicom, 1976, p. 10). No faults were observed in the trench. Envicom dated a caliche nodule, found in the oldest paleosol present, at 4050± 100 y.b.p.

The second trench was placed just north of Tierra Rejada Valley, next to a pond, the origin of which has been attributed to fault movement since it sits astride the trace of the Simi fault (Envicom, 1976, p. 12-15). (Neither the 1951 7.5 minute Simi quadrangle, nor the 1921 and 1941 versions of the 15 minute Piru quadrangle shows a pond or closed depression in this location) thus raising the question

whether this is a natural or man-made feature). A trench was dug across the old alluvial deposits, starting in the Sespe Formation on the north and ending in the Conejo Volcanics on the south. Faulting was observed in both bedrock units (the trench log does not show any apparent offset of the soil over the Conejo Volcanics; however, the base of the soil over the Sespe Formation is irregular), but not in the older alluvium. No datable material was found in the trench, but the consultants believed that this older alluvium is pre-Holocene in age. Thus, Envicom (p. 14-15) concluded that the fault is probably pre-Holocene.

6. Interpretation of air photos: Not attempted.

7. Field observations:

A cursory examination of the topography along the fault north of Tierra Rejada Road was made. No features indicative of recent strike-slip (or any other type of) faulting were noted. I was unable to confirm the existance of a fault in the location shown by Weber, et al. (1975). If such a fault does exist, then it is not the major bedrock boundary. The freeway immediately east of Envicom's Tierra Rejada Trench was examined, and a number of faults in a zone a few hundred feet wide, were observed; but none appeared to affect the poorly developed soil horizon.

8. Conclusions:

While the Simi fault may have been active during the late Pleistocene (Weber, et al., 1975; and Ziony, et al., 1974 -- see item 5), it apparently has not been active during the Holocene (Envicom, 1976). The possibility exists that one of the faults within the Sespe, or even Conejo Volcanics, may be Holocene in age, however. The zone is locally well-defined, but is ill-defined in the Camarillo quadrangle.

Using the present project guidelines, the fault is believed to not be sufficiently active, but the evidence is not conclusive.

9. Recommendations:

Using the present project guidelines, the Simi fault should not be zoned as there is no substantial evidence indicating Holocene activity. While the inactivity of the fault has not been conclusively demonstrated, evidence indicates that the fault is probably pre-Holocene (Envicom, 1976). No further work is recommended on the part of this project's personnel.

10. Investigating geologist's name; date:

Theodore C. Smith

THEODORE C. SMITH
Assistant Geologist
November 28, 1977

I agree with recommendations.
ELLA
12/12/77